

## ADLN-PERPUSTAKAAN UNIVERSITAS AIRLANGGA

## ABSTRACT

Atherosclerosis Prevention Mechanism Through Purple Sweet Potato (*Ipomoea batatas*) Consumption: Roles of Intracellular HSP 70, Extracellular HSP 70, Lipoprotein Associated Phospholipase A2 (Lp-PLA2), High Sensitivity C-Reactive Protein (hs-CRP) toward Foam Cell  
(Laboratory Research on *Rattus norvegicus*)

**Background:** Atherosclerosis is a chronic inflammatory disease involving immunological activity, inflammatory cells, proinflammatory cytokines, and primitive proteins. Natural food ingredients are highly consumed to prevent atherosclerosis. People consuming purple sweet potato (*Ipomoea batatas*) have lower incidence of coronary heart disease.

**Objective:** To prove the mechanism of atherosclerosis prevention through the provision of purple sweet potato (*Ipomoea batatas*).

**Methods:** This research used a randomized post test only control group design using 18 white rats (*Rattus norvegicus* wistar strain) that were divided into three groups containing six rats in each group, namely, the first group was normal group, the second group was given atherosclerotic diet, and the third group was a treatment group given diet of atherosclerotic and purple sweet potato (*Ipomoea batatas*) extract orally (26.6 mg). After 90 days of treatment, blood sampling was carried out for measuring the levels of extracellular Heat Shock Protein 70 (e HSP70), high sensitivity-creactive protein (hs-CRP), lipoprotein associated phospholipase A2 (Lp-PLA2) enzyme using ELISA and measuring the intracellular Heat Shock Protein 70 (i HSP70) expression in the monocytes using immunocytochemistry and histopathologic observation on the number of foam cells in rats' aorta.

**Result:** The administration of purple sweet potato (*Ipomoea batatas*) extract is proved to decrease hs-CRP level and the number of foam cells in the aorta. Increase of i HSP70 expression in monocytes, activity of Lp-PLA2 enzyme and e HSP70 level in circulation occur. Path analysis showed two significant path in atherosclerosis prevention : *Ipomoea batatas* - i HSP70 - foam cell and *Ipomoea batatas* - i HSP70 - e HSP70 - Lp-PLA2 - foam cell. Path of *Ipomoea batatas* - i HSP70 - foam cell is more dominant to prevent atherosclerosis. The role of intracellular Heat Shock Protein 70 (i HSP70) is dominant on the path as molecular cheperon fuctioned as cytoprotective on monocyte.

**Conclusion:** The extract of purple sweet potato (*Ipomoea batatas*) can reduce hs-CRP, foam cell and improve i HSP70, Lp-PLA2 and e HSP70. The main line in the prevention of atherosclerosis is through *Ipomoea batatas* - i HSP70 - foam cell and is dominated by the role of i HSP 70

**Keywords:** atherosclerosis, foam cell, i HSP70, *Ipomoea batatas*